REMARKS

This communication is responsive to the Office Action mailed 18 July 2006. No amendments have been made. Claims 1-28 are pending.

The Office Action raises US patent No. 6,917,614 (Laubach et al.) in connection with currently pending claims 1-28. The Applicant submits that claims 1-28 patentably distinguish Laubach. et al.

Claims 1-10 and 28

Claim 1 recites "a bridge having a plurality of bridge ports, a first one of the bridge ports having a plurality of service interfaces, each of the service interfaces associated with a channel in a connection-based network". Page 2 of the Office Action expresses the view that Laubach et al. discloses "a bridge (see Fig. 1 & 38, item 103) having a plurality of bridge ports (see Fig. 1 & 38, items 310, 311, 2101, 2103) a first one of the bridge ports having a plurality of service interfaces: (see col. 32, lines 1-11, Fig. 31 items 311, 2101, and 2103. The integrated services interfaces includes Video Controller Port Card 2101 and Voice Controller Port Card 2103 means a plurality of service interfaces), each of the service interfaces associated with a channel (see Fig. 1 & 38, col. 8, lines 16-28) in a connection-based network (see col. 12, lines 16-59)."

With respect, the Applicant submits that the Examiner has misinterpreted the cited passages of Laubach et al. More particularly, claim 1 recites that one of a plurality of bridge ports has a plurality of service interfaces and that each of the service interfaces is associated with a channel on a connection based network. Laubach et al. do not teach or suggest this claim 1 feature. The Examiner contends on page 2 of the Office Action that the claim 1 "plurality of bridge ports" are items 310, 311, 2101 and 2103 of Figure 38. Figure 38 clearly shows that each of ports 310, 311, 2101 and 2103 has a only single corresponding interface to ATM switch fabric 305. In direct contrast to the Figure 38 ports, claim 1 recites "a first one of the bridge ports having a plurality of service interfaces, each of the service interfaces associated with a channel in a connection-based network." No single Figure 38 port (i.e. no

single one of ports 310, 311, 2101 or 2103) has a plurality of service interfaces to an ATM or connection based network.

The Examiner contends that col. 32, lines 1-11 of Laubach et al. disclose a port having a plurality of service interfaces. This interpretation is incorrect. Col. 32, lines 1-11 of Laubach et al. refer to the head end controller 103 of Figure 21 and teach that head end controller 103 includes a video port card 2101 and voice port card 2103. The Examiner expresses the view that video port 2101 and voice port 2103 represent the claim 1 "plurality of service interfaces". However, as discussed above the Examiner relies on video port 2101 and voice port 2103 as the claim 1 "ports". Figure 21 clearly shows that video port 2101 connects to Common ATM Switch Fabric 305 on a single interface (line 2102) and voice port 2103 connects to Common ATM Switch Fabric 305 on a single interface (line 2104). To the extent that video port 2101 and voice port 2103 comprise both "ports" and "service interfaces", it is clear from Figure 21 that there is a one-to-one correspondence video port 2101 (the "port") and its connection 2102 (the "interface") to Common ATM Switch Fabric 305. Similarly, there is a one-to-one correspondence between voice port 2103 (the "port") and its connection 2104 (the "interface") to Common ATM Switch Fabric 305. In direct contrast, to this one-to-one correspondence, claim 1 recites a "plurality of bridge ports" and that a first one of the plurality of bridge ports has a "plurality of service interfaces" wherein each of the service interfaces is associated with a channel in a connection based network. This represents a one-to-many relationship between the claim 1 "first one of the bridge ports" and its "plurality of service interfaces". Video port 2101 and voice port 2103 disclosed by Laubach et al. do not exhibit such a one-to-many relationship. The Figure 21 system does not include a bridge port having multiple service interfaces to service corresponding channels in a connection-based network as recited in claim 1.

Based on this reasoning, the Applicant submits that Laubach et al. do not teach or suggest the claim 1 feature of "a bridge having a plurality of bridge ports, a first one of the bridge ports having a plurality of service interfaces, each of the service interfaces associated with a channel in a connection-based network".

Claim 1 also recites "a map ... providing a correspondence between each of the plurality of priorities and one of the service interfaces." Pages 2 and 3 of the Office Action expresses the view that Laubach et al. describes "a map associated with the first one of the bridge ports (see Fig. 28, item 2702), the map providing a correspondence between each of the plurality of priorities and one of the service interfaces (see col. 25, line 38-51 or col. 39, lines 27-50, Fig. 33, item 3318, 3302 and item 3320 in item 3101). The Applicant submits that the Examiner has misinterpreted the cited aspects of Laubach et al.

Figure 28, item 2702 of Laubach et al. represents a look up table for port card 2701 which maps an ATM cell on the basis of VCI/VPI information (see description of Figures 27 and 28 at col 35, ln. 54-col. 37, ln. 18). Look up table 2702 does not map data frames on the basis of user priority as recited in claim 1. Furthermore, look up table 2702 merely swaps VPI and VCI values to permit a cell having a VPI value in excess of 255 to pass through a common ATM UNI switch fabric (col. 35, ln. 62-67). Look up table 2702 does not provide a correspondence between user priorities and corresponding service interfaces as recited in claim 1.

Col. 39, ln. 27-50 and Figure 33 (items 3318, 3302 and 3320) of Laubach et al. describe how ATM Cell Scheduler 3318 "performs a lookup of the virtual connection information 3319 in Queue Mapping Table 3320 to obtain the queue identifier ('Queue ID')." Figure 33 shows that the "connection information" used to perform this mapping is VPI, VCI information (see reference numeral 3319 of Figure 33). Col. 39, ln. 27-50 and Figure 33 (items 3318, 3302 and 3320) of Laubach et al. do not describe mapping data frames on the basis of user priority information as recited in claim 1. Col. 39, ln. 27-50 and Figure 33 do not describe a map which provides a correspondence between user priorities and corresponding service interfaces as recited in claim 1.

Col. 25, ln. 38-51 of Laubach et al. refer to Figure 10 and describe a Queue Controller 1018 that "performs a look up of the virtual connection information 1019 in the Queue Mapping Table 1020 to obtain the queue identifier ('Queue ID') number in which to place the ATM cells." Figure 10 shows that the "connection information" used to perform this mapping

is VPI, VCI information (see reference numeral 1019 of Figure 10). Queue Mapping Table 1020 provides a mapping between VPI, VCI information and a Queue ID number. Col. 25, ln. 38-51 and Figure 10 of Laubach et al. do not describe mapping data frames on the basis of user priority information. Col. 25, ln. 38-51 and Figure 10 do not describe a map which provides a correspondence between user priorities and corresponding service interfaces as recited in claim 1.

Based on this reasoning, the Applicant submits that Laubach et al. do not teach or suggest the claim 1 feature of "a map ... providing a correspondence between each of the plurality of priorities and one of the service interfaces."

Claim 1 also recites "a forwarding system configured to read a priority of a data frame to be forwarded onto the connection-based network by way of the first one of the ports, identify a service interface which the map indicates corresponds to the read user priority and forward the data frame over the channel in the connection-based network associated with the identified service interface." The Examiner expresses the view (on page 3 of the Office Action) that the features of this claim 1 "forwarding system" are met by the three-port bridge 902 disclosed by Laubach et al. in Figure 9 and at: col. 19, ln 5-25; col. 19, ln. 63-col. 20, ln. 20; and col. 21, ln. 5-20. The Applicant respectfully submits that the Examiner has misinterpreted the cited aspects of Laubach et al.

Figure 9 of Laubach et al. is a schematic depiction of an Ethernet Root Controller 802 which receives ethernet packets on line 801 and forwards ATM data frames on ATM channel 917. After receiving an ethernet packet, Three-Port Bridge (Root Forwarder) 902 makes an inquiry 906 to Bridge Table Processor 907 based on information obtained from the ethernet packet. The information contained in inquiry 906 is explained at col. 19, ln. 10-19 and includes "the Destination Address ('DA'), the Source Address ('SA'), and the Ethernet Type field ('ETYPE'), additionally the port number that the Ethernet frame was received on, the first 64 octets of the Ethernet frame data or the entire data if less than 64 octets, the encapsulation type is set to 'null' and the VPI and VCI set to 0." The information in the inquiry 906 does not include a user priority read from a data frame to be forwarded onto the

connection-based network as recited in claim 1. As explained at col. 19, ln. 29-26, Bridge Table Processor 907 uses the information in inquiry 906 to perform a table lookup and returns a "response on line 908 comprised of the forwarding port number, the VPI/VCI values for the ATM, the ATM encapsulation type, a priority indication, a virtual LAN identifier, the destination address and the source address. Thus, Laubach et al. teach that priority information is determined by a table lookup in Bridge Table Processor 907. In direct contrast to Three-Port Bridge 902 of Laubach et al., claim 1 recites reading user priority from a data frame to be forwarded on a connection based network. Three-Port Bridge 902 does not even have access to the ATM data frame which will eventually be sent over ATM link 917, as ATM cells 905 are only assembled further downstream by Segmentation Processor 904. Based on this reasoning, the Figure 9 Three Port Bridge 902 does not amount to the claim 1 "forwarding system" which reads user priority information from a data frame and uses the user priority information read from the data frame to perform a number of actions.

The Examiner cites Col. 21, ln. 5-20 of Laubach et al. This passage describes the operation of an ATM Scheduler 910 (Figure 9). ATM Scheduler 910 receives ATM cells on line 905 and "performs a lookup of the virtual connection information 911 in the Quality of Service ('QoS') table 912 to obtain the QoS information 913." ATM Scheduler 910 then uses this QoS information to queue the ATM cells before transmitting ATM "cells 914 to the ATM network interface 915 for transmission over the ATM link 918 to ATM switch #1 803". This aspect of Laubach et al. describes how ATM Scheduler 910 uses VPI/VCI connection information read from an ATM cell to obtain QoS information. In direct contrast to ATM Scheduler 910, the claim 1 forwarding system is recited to make use of user priority information read from a data frame to perform a lookup in a map which maps user priorities to service interfaces. More specifically, claim 1 recites "a map ... providing a correspondence between each of the plurality of priorities and one of the service interfaces;" and "a forwarding system configured to read a priority of a data frame to be forwarded onto the connection-based network by way of the first one of the ports, identify a service interface which the map indicates corresponds to the read user priority and forward the data frame over the channel in the connection-based network associated with the identified service interface." Based on this reasoning, the Figure 9 ATM Scheduler 910 does not provide the claim 1 forwarding system

which reads user priority information from a data frame and uses the user priority information read from the data frame to perform a number of actions.

Ethernet Root Controller 802 shown in Figure 9 of Laubach et al. and described at col. 19-21 has only a single output interface 917 to an ATM switch 803. While Three-Port Bridge 902 can influence the assembly of ATM data frames and ATM Scheduler 910 can influence the QoS and corresponding timing of transmission of the assembled ATM data frames, to the extent that the Figure 9 Ethernet Root Controller 802 outputs ATM frames, all such ATM data frames are output on ATM interface 917 and all such ATM data frames are received by ATM switch 803 where they may then be switched to various ATM channels. In direct contrast, claim 1 recites a bridge port having a "plurality of service interfaces, each of the service interfaces associated with a channel in a connection-based network" and "a forwarding system configured to ... identify a service interface which the map indicates corresponds to the read user priority and forward the data frame over the channel in the connection-based network associated with the identified service interface." Ethernet Root Controller 802 does not exhibit the recited features of claim 1 "forwarding system" which forwards ATM cells onto various service interfaces, where each service interface is associated with a corresponding channel in a connection-based network.

In the Response to Arguments section of the Office Action, the Examiner raises Figure 10 and col. 25, ln. 38-51 of Laubach et al. in connection with the claim 1 "forwarding system". Figure 10 and col. 25, ln. 42-47 of Laubach et al. disclose "Queue Controller 1018 maintains many internal queues in strict priority number and transmits cells 1022 from the highest priority queue ... to ATM Network Interface 1002 for transmission over ATM link 1001 to ATM switch #3 803." This statement suggests that the Laubach et al. queues are internal to Queue Controller 1018 and that only the currently highest priority queue is sent over a single ATM interface 1002. In direct contrast to this teaching of Laubach et al., claim 1 recites one bridge port "having a plurality of service interfaces, each of the service interfaces associated with a channel in a connection based network" and that the forwarding system is configured to "identify a service interface which the map indicates corresponds to the read user priority and forward the data frame over the channel in the connection based network

associated with the identified service interface." These claim 1 features allow the claim 1 "forwarding system" to select between multiple service interfaces depending on user priorities. Queue Controller 1018 does not forward ATM cells onto multiple different service interfaces.

The Examiner also states in the Response to Arguments section of the Office Action that ATM cells are directed to video card 2101, voice card 2103 or ethernet card 311 which represent the claim 1 "service interfaces". However, as discussed above, the Examiner also relies on video card 2101, voice card 2103 and ethernet card 311 as the claim 1 "ports". As discussed above, Figure 21 clearly shows that video port 2101 connects to Common ATM Switch Fabric 305 on a single interface (line 2102) and voice port 2103 connects to Common ATM Switch Fabric 305 on a single interface (line 2104). To the extent that video port 2101 and voice port 2103 comprise both "ports" and "service interfaces", it is clear from Figure 21 that there is a one-to-one correspondence video port 2101 (the "port") and its connection 2102 (the "interface") to Common ATM Switch Fabric 305. Similarly, there is a one-to-one correspondence between voice port 2103 (the "port") and its connection 2104 (the "interface") to Common ATM Switch Fabric 305. In direct contrast, claim 1 recites a "plurality of bridge ports" wherein "a first one of the bridge ports has a plurality of service interfaces". This represents a one-to-many relationship between the claim 1 "first one of the bridge ports" and its "plurality of service interfaces". Furthermore, there is no indication in Laubach et al. that Queue Controller 1018 (which is alleged to be the claim 1 "forwarding system") directs ATM cells 1028 to video card 2101, voice card 2103 or ethernet card 311. Figure 10 clearly shows that Queue Controller 1018 directs ATM cells 1022 toward a single ATM interface 1002. This is corroborated by col. 25, ln. 42-47 of Laubach et al. which specifically disclose "Queue Controller 1018 ... transmits cells 1022 from the highest priority queue ... to ATM Network Interface 1002 for transmission over ATM link 1001 to ATM switch #3 803."

Based on this reasoning, the Applicant submits that Laubach et al. fail to teach or suggest "a forwarding system configured to read a priority of a data frame to be forwarded onto the connection-based network by way of the first one of the ports, identify a service interface which the map indicates corresponds to the read user priority and forward the data

frame over the channel in the connection-based network associated with the identified service interface" as recited in claim 1.

For all of the reasons outlined above, the Applicant submits that claim 1 patentably distingushes Laubach et al.

Claims 2-10 and 28 depend from claim 1 and are submitted to patentably distinguish the cited prior art for at least this reason. In addition, dependent claims 2-10 and 28 recite additional features that distinguish Laubach et al.:

- Claim 4 recites that "each of the service interfaces associated with the first one of the bridge ports is associated with a channel having the same predetermined VPI". The Office Action alleges that this feature is disclosed at col. 19, ln. 4-26 or col. 39 ln. 27-50. The Applicant's agent has carefully read these passages and cannot find any disclosure of a port associated with a plurality of service interfaces wherein the service interfaces are each associated with a channel identified by a VPI/VCI wherein the VPI values are the same for the corresponding channels for all of the plurality of service interfaces.
- Claim 7 recites "assign a priority to the data frame based upon the correspondence provided by the map and tag the data frame with the assigned priority". The Office Action suggests that this feature is found at col. 39, ln. 27-50. However, this passage discusses placing ATM cells in queues and not tagging data frames, as claimed. The Office Action also refers to col. 28, ln. 13-23. This passage indicates that a downstream slot structure may include a single Cell Loss Priority bit but does not disclose setting the CLP based on a correspondence indicated by a map in the context of claim 7.
- Claim 8 recites a plurality of maps "wherein the forwarding system is configured to determine a number of available channels associated with the first bridge port and to select one of the plurality of maps in the scheme based upon the number of available channels". The Office Action indicates that this feature is disclosed at col. 35, ln. 54 to col. 36 ln. 51. This is not correct. The cited passage refers to swapping VPI and VCI values to allow ATM cells with VPI values larger than 8 bits to pass through an ATM UNI switch fabric. There is no disclosure that different maps are selected based upon a

number of available channels at a port. There is no disclosure that the maps are the maps as claimed in claim 1.

- Claim 10 recites a specific correspondence of priorities to channels. The Office Action states that this correspondence can be found at col. 27 ln. 34 to col. 28 ln. 61. This is incorrect. The cited passage describes downstream and upstream slot structures which have nothing to do with the correspondence between priorities and channels and especially do not disclose the specific correspondence recited in claim 10.

Claims 1-10 and 28 are therefore all submitted to be patentably distinct from Laubach.

Claims 11-15

Claim 11 recites "a plurality of bridge ports;" and "a plurality of service interfaces associated with the first one of the bridge ports, each of the service interfaces capable of being associated with a channel in a connection-based network." The Applicant submits that Laubach et al. does not teach or suggest this feature of claim 11. More particularly, Laubach et al. fail to disclose a single bridge port which has a plurality of interfaces, where each service interface is associable with a channel on a connection-based network. As discussed above in relation to claim 1, the cited Figures and description of Laubach et al. teach that each of the Laubach et al. bridge ports (i.e. ports 310, 311, 2101 and 2103) has a only single corresponding interface to ATM switch fabric 305.

Claim 11 also recites "means for reading priorities of data frames directed by the bridge to the least a first one of the bridge ports". Laubach et al. fail to disclose this claim 11 feature. As discussed above in relation to claim 1, Laubach et al. teach that priority information is assigned by Bridge Table Processor 907 in response to a inquiry 906 from Three Port Bridge 902. Three Port Bridge 902 does not read user priority information from ATM data frames. Three Port Bridge 902 does not even have access to ATM data frames which are formed further downstream in ATM Segmentation Processor 904. Laubach et al. also teach that connection information (VCI/VPI information) is used by ATM Scheduler 910 to perform a table lookup (inquiry 911 of QoS table 912) to obtain QoS information 913. Laubach et al. do not teach or suggest that ATM Scheduler 910 reads priority information from the data

frames that it receives. Laubach et al. does not disclose or suggest that user priorities are read from data frames that are directed to one of the bridge ports as recited in claim 11.

Claim 11 also recites "means for determining a number of the service interfaces associated with active channels in the connection-based network". The Examiner makes no reference to where this claim 11 feature is shown by Laubach et al. The Applicant respectfully submits that Laubach et al. do not disclose determining a number of service interfaces associated with active channels as recited in this claim 11 feature nor any means for accomplishing such a determination.

Claim 11 also recites "means for establishing a mapping between user priorities read by the means for reading priorities of data frames and the service interfaces associated with active channels in the connection-based network based at least in part on a number of the service interfaces associated with active channels in the connection-based network". While the Examiner alleges the existence of a map providing a correspondence between each of the plurality of priorities and one of the service interfaces on page 2 and 3 of the Office Action (an allegation contested by the Applicant as discussed above), the Examiner makes no reference to where Laubach et al. disclose a "means for establishing" such a mapping. The Applicant respectfully submits that Laubach et al. do not disclose a means for establishing a mapping between user priorities and service interfaces associated with active channels as recited in this claim 11 feature.

Claim 11 also recites "means for assigning frames to the service interfaces based upon the user priorities and the mapping." The Examiner makes no reference to where this claim 11 feature is shown by Laubach et al. The Applicant respectfully submits that Laubach et al. do not disclose the claim 11 mapping between user priorities and service interfaces associated with active ATM channels and that Laubach et al. do not disclose assigning frames to service interfaces based on user priorities and the mapping as recited in this claim 11 feature.

For all of the reasons outlined above, the Applicant submits that claim 11 patentably distingushes Laubach et al.

Claims 12-15 depend from claim 11 and are submitted to patentably distinguish the cited prior art for at least this reason. Claims 12 and 15 further distinguish Laubach et al. as claims 12 and 15 recite features similar to claims 8 and 10 which are not disclosed in the cited passages of Laubach et al. as discussed above.

Therefore, claims 11-15 are submitted to patentably distinguish Laubach et al.

Claims 16-27

Claim 16 recites the combination of "receiving at a first bridge port connected to a first segment of a VLAN a frame addressed to a node on a second segment of the VLAN;" and "forwarding the frame to a second bridge port associated with a second segment of the VLAN and determining a user priority of the frame." Laubach et al. do not disclose determining a user priority from a data frame received at a first port and forwarding the data frame from a first port on a first segment of a VLAN to a second port on a second segment of the VLAN. In contrast, as discussed above in relation to claim 1, Laubach et al. teach that priority information is assigned by Bridge Table Processor 907 in response to a inquiry 906 from Three Port Bridge 902. Three Port Bridge 902 does not read priority information from incoming ATM data frames. Three Port Bridge 902 does not even have access to ATM data frames which are formed further downstream in ATM Segmentation Processor 904. Laubach et al. also teach that connection information (VCI/VPI information) is used by ATM Scheduler 910 to perform a table lookup (inquiry 911 of QoS table 912) to obtain QoS information 913. Laubach et al. do not teach or suggest that ATM Scheduler 910 reads priority information from the data frames that it receives or from the data frames that it forwards onto ATM link 917. Laubach et al. do not disclose or suggest that user priorities are read from data frames that are received at a first port on a first VLAN segment and forwarded to a second port on a second VLAN segment, as recited in claim 11.

Claim 16 also recites "based on the user priority, assigning the frame to one of a plurality of service interfaces associated with the second bridge port, each of the service interfaces associated with a corresponding channel in a connection-based network and capable

of delivering data to the second segment of the VLAN by way of the corresponding channel in the connection-based network." The Applicant submits that Laubach et al. fail to teach or suggest this claim 16 feature. More particularly, Laubach et al. fail to disclose a single bridge port on a first segment of a VLAN which has a plurality of service interfaces, where each service interface is associated with a channel on a connection-based network as recited in claim 16. As discussed above in relation to claim 1, the cited Figures and description of Laubach et al. teach that each of the Laubach et al. bridge ports (i.e. ports 310, 311, 2101 and 2103) has a only single corresponding interface to ATM switch fabric 305.

While the Examiner alleges the existence of a plurality of service interfaces on page 2 of the Office Action (an allegation contested by the Applicant as discussed above), the Examiner makes no reference to where Laubach et al. disclose a "based on the user priority, assigning a frame to one of the plurality of service interfaces" as recited in this claim 16 feature. The Applicant respectfully submits that Laubach et al. do not disclose the claim 16 assignment of a data frame to a service interface on the basis of user priority.

Based on this reasoning, the Applicant submits that claim 16 patentably distingushes Laubach et al.

Claims 17-27 depend from claim 16 and are submitted to patentably distinguish the cited prior art for at least this reason. In addition, dependent claims 17-27 recite additional features that distinguish Laubach et al.:

- Claim 19 recites a feature similar to the feature of claim 8 (discussed above) which is not disclosed by Laubach.
- Claim 20 recites a feature similar to the feature of claim 10 (discussed above) which is not disclosed by Laubach.
- Claim 21 recites "while a current mapping is in effect, determining that a next channel has become available and switching to a next mapping, wherein the next mapping differs from the current mapping only in that one or more priorities are associated with the next channel". The Office Action states that this feature is disclosed at col. 38, ln. 40-65 and col. 42, ln. 4-56. This is incorrect. The passage of col. 38 does not disclose

determining that a next channel has become available. The passage of col. 42 discloses ways to implement a "QoS Knob" whereby a user can request higher quality connections. This passage does not disclose determining that a next channel has become available, as claimed in claim 21.

- Claim 22 recites "upon failure of a channel associated with one of the service interfaces, adjusting the mapping by remapping one or more priorities associated with the one of the service interfaces to one or more other ones of the service interfaces". The Office Action cites col. 36, ln. 4 to col. 37, ln. 55. However, the cited passage does not discuss failure of any channel.
- Claim 26 recites a feature similar to that of claim 7 and is submitted to distinguish Laubach.
- Claim 27 recites a map that associates "a plurality of priorities with the identified service interface". It is submitted that Laubach does not disclose such a map in the context of claim 27.

For at least these reasons, claims 16-27 are submitted to be patentable over Laubach.

Conclusions

In view of the arguments presented above, the Applicant submits that this application is in condition for allowance and respectfully requests reconsideration and allowance of this application in light of the foregoing amendments and comments.

Respectfully submitted,

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